

Initiation of a new infection control system for the COVID-19 outbreak



In December, 2019, a group of patients with pneumonia of unknown origin, most of whom had been exposed to the Huanan seafood wholesale market in Wuhan, China, was first reported.¹ Using deep sequencing analysis, Chinese authorities identified a new betacoronavirus (severe acute respiratory syndrome coronavirus 2; SARS-CoV-2) as the cause of the outbreak, and found that SARS-CoV-2 belongs to a clade within the subgenus sarbecovirus, orthocoronavirinae subfamily.² As of Feb 10, 2020, the ongoing outbreak of coronavirus disease 2019 (COVID-19) originating in Wuhan had caused 42 638 confirmed cases and 1016 deaths, with 32 provinces and regions of China affected.³ As a global public health threat, the COVID-19 outbreak has also raised worldwide public concern, with increasing travel-associated cases confirmed in multiple countries, including South Korea, Thailand, Japan, the USA, Vietnam, and Germany.⁴⁻⁶

By Feb 10, 2020, Guangdong Second Provincial General Hospital (Guangzhou, Guangdong Province, China), as a provincial emergency hospital, had admitted more than 30 confirmed cases of COVID-19 and more than 200 suspected cases. Hospital-related transmission of the virus was suspected in up to 29% of health-care workers.⁷ Thus, to try to avoid nosocomial infection, the hospital set up an innovative infection-control system called the observing system, which has been highly recommended by the frontline medical staff.⁸ This innovation originated from the national emergency medical team in field rescue. Negative pressure isolation wards, generally the most dangerous area in the hospital for airborne diseases, are where all the confirmed cases receive medical care as a standard practice. Despite multiple preventive procedures, it is not uncommon that medical personnel in these wards might not be fully aware of their exposure while caring for patients; therefore, setting up an infection control system to provide real-time monitoring and aid for instant correction is of high importance to minimise the risk of nosocomial infection. All infection control observers, appointed by the Department of Infection Control and Nursing in Guangdong Second Provincial General Hospital, have undergone intensive training

to become familiar with the requirements for infection control in the negative pressure isolation wards. Herein, cameras cover the entire ward except for the privacy area. The infection control observer monitors medical staff in real time via computer monitors in a separate area (figure). The main responsibilities of the observer are to maintain the normal operation of the negative pressure isolation wards, supervise the implementation of disinfection, ensure a sufficient supply of protective materials, arrange specimens for inspection, and relieve anxiety of the medical personnel while treating patients.

The observers pay attention to the medical staff not only during their time in the negative pressure ward, but also during the putting on or taking off of protective equipment when they enter or leave the ward. Although the health-care providers have attended multiple training sessions and emergency drills, in operation (especially in high-stress negative pressure wards) some steps might be omitted or overlooked, thus incurring potential exposure to nosocomial infection. For example, when a nurse helped an elderly patient pull up a zipper in the negative pressure ward, the zipper unexpectedly ripped the nurse's glove. The nurse became nervous, and anxious to continue her procedures. Discovering this situation on screen, the observer immediately soothed the nurse and sent

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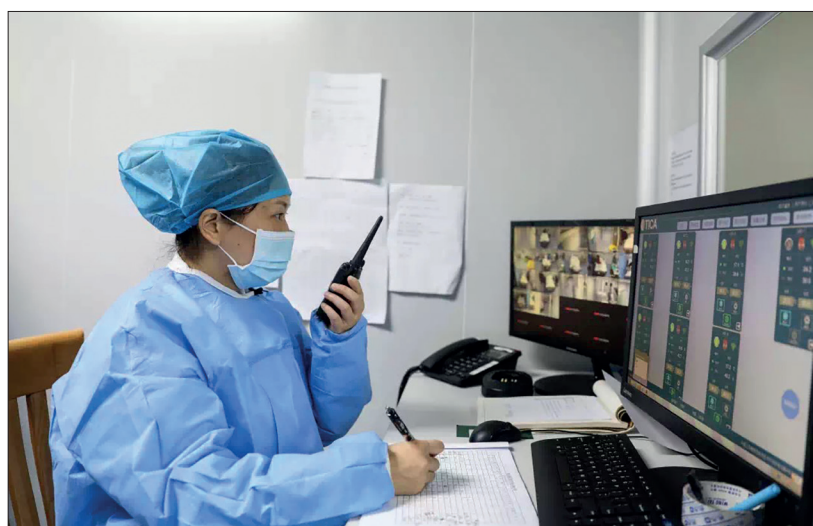


Figure: An on-duty observer providing instructions to the health-care provider in negative-pressure isolation wards

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another staff member into the ward to assist. Following the occupational exposure process, the observer then instructed the nurse to remove her gloves carefully, disinfect her hands, and dispose of the ripped gloves. The observer also systematically assessed the risks for the nurse and arranged a quarantine room for medical observation to ensure full safety before she was allowed to return to the negative pressure ward.

The observing system, as a proactive infection control tool, provides immediate prevention against nosocomial infection in negative pressure isolation wards, which offers creative assistance to combat the COVID-19 outbreak. Guangdong Second Provincial General Hospital plans to incorporate artificial intelligence image recognition into the observing system, aiming to enhance the sensitivity and accuracy of instant detection. Implementing and improving the observing system might be a promising endeavor for controlling nosocomial infection of the COVID-19 outbreak and other acute infectious diseases.

We declare no competing interests.

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- 1 Lu H, Stratton CW, Tang Y-W. Outbreak of pneumonia of unknown etiology in Wuhan China: the mystery and the miracle. *J Med Virol* 2020; published online Jan 16. DOI:10.1002/jmv.25678.
- 2 Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020; **395**: 497–506.
- 3 China CDC weekly. National Health Commission Update on February 11, 2020. <http://www.nhc.gov.cn/xcs/yqtb/202002/4a611bc7fa20411f8ba1c8084426c0d4.shtml> accessed (Feb 11, 2020).
- 4 WHO. Pneumonia of unknown cause—China. 2020. <https://www.who.int/csr/don/05-january-2020-pneumonia-of-unknown-cause-china/en/> (accessed Jan 5, 2020).
- 5 WHO. Novel coronavirus—China. 2020. <https://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/> (accessed Jan 12, 2020).
- 6 WHO. IHR emergency committee on novel coronavirus (2019-nCoV). 2020. [https://www.who.int/dg/speeches/detail/who-director-general-statement-on-ihr-emergency-committee-on-novel-coronavirus-\(2019-ncov\)](https://www.who.int/dg/speeches/detail/who-director-general-statement-on-ihr-emergency-committee-on-novel-coronavirus-(2019-ncov)) (accessed Jan 30, 2020).
- 7 Wang D, Hu B, Hu C, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. *JAMA*, 2020; published online Feb 7. DOI:10.1001/jama.2020.1585.
- 8 Guangzhou Daily. A Guangzhou hospital admitted 12 cases of confirmed cases, and they created the 'observing system'. <https://pc.gzdaily.cn/amucsite/pad/index.html?from=timeline&isappinstalled=0#/detail/1136795?site4> (accessed Jan 30, 2020).